

ABSTRACT

A high permittivity gate dielectric is used in an NROM memory cell. The gate dielectric has a dielectric constant greater than silicon dioxide and is comprised of an atomic layer deposited and/or evaporated nanolaminate structure. The NROM memory cell has a substrate with doped source/drain regions. The high-k gate dielectric is formed above the substrate between a pair of the source/drain regions. A polysilicon control gate is formed on top of the gate dielectric. The gate dielectric can have an oxide – high-k dielectric – oxide composite structure, an oxide – nitride – high-k dielectric composite structure, or a high-k dielectric – high-k dielectric – high-k dielectric composite structure.